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ANGLER USE OF NORTHERN PIKE IN NORTHWEST WISCONSIN

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Northern pike (Esox lucius) are one of Wisconsin's most popular game fishes. Small pike are valued for taste and large pike for size. Northern pike are commonly found in over a half million acres of inland lakes and rivers in Wisconsin; northwest Wisconsin produces an estimated 28% of the state harvest (WDNR 1979). We recently conducted a 3-year tagging study to determine: 1) the vulnerability of northern pike to angler harvest and 2) information on who harvests pike and when. For this study we used two pieces of information: 1)length data from our own spring sampling and tagging effort and 2)northern pike tags returned to us by anglers. In this issue of "Findings" we report on angler returns of northern pike tags and the relative importance of pike to both resident and nonresident anglers.

Pike Marking and Tag Recovery

We selected 16 study lakes from which to sample spawning northern pike using fyke nets (Fig. 1). The criteria we used for lake selection included lake morphometry and the density, growth characteristics, and size structure of pike populations in the lakes. From spring 1984 through spring 1987 we sampled and tagged a total of 5,647 sexually mature pike from these lakes. We tagged virtually every fish netted. The number of pike tagged in each lake ranged from 31 to 811. All tagged pike were sexed, measured (total length) to the nearest 0.1 inch, weighed to the nearest ounce, and marked with individually numbered Floy anchor tags. The tags were attached in the back of the pike near the posterior base of the dorsal fin, and the fish were then released.

Throughout the study period, anglers returned the tag information by letter, phone call, or deposit of the tag at a DNR office. The numbers of the returned tags were recorded along with the month and year of the harvest and the angler's residence when known. This information was summarized by the season of harvest (open water or ice fishing seasons) and by angler residence. The open water period ran from early May through November 15.

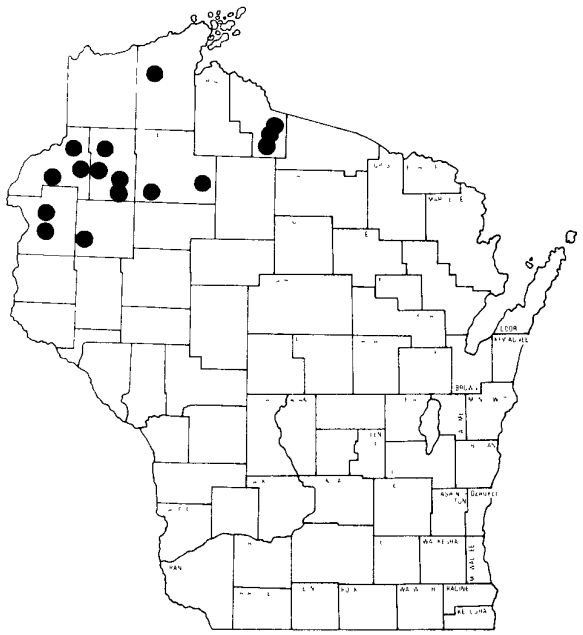

Figure 1. Location of lakes sampled for northern pike 1984-1987.

The ice fishing period ran from November 16 through March 1. In analyzing the harvest vulnerability of pike, only data for first-year tag returns (one year after tagging) were used. For the angler information, we used data from all tag returns.

Using Returned Tags to Determine Harvest Vulnerability of Pike

We wanted to know if certain size groups of pike were more vulnerable than others to angling. To determine this we compared fish harvested by anglers with the size of all fish tagged from each lake. Length at spring tagging was used for this comparison. For example, when a tag was returned to us, we noted the length we had recorded for that pike during the previous spring. When all of the tags had been returned and all the corresonding lengths noted, we compared the mean size of the harvested pike with the mean size of the spring sample. We did not use lengths reported by anglers for two reasons: 1) these lengths could not have been verified for accuracy and 2) growth would have occurred since tagging. For this analysis we used only tag numbers from lakes where anglers returned 10 or more tags during the first year after tagging.

Harvest Vulnerability of Pike

During the first year after tagging, anglers returned 10 or more tags from 8 of the original 16 study lakes. In 7 of these 8 lakes, pike harvested by anglers were on average 1.7 inches longer than the average length of the pike in those lakes at the time of the spring sampling (Table 1). Little Pike Lake in Iron County was the only lake of the 8 where the tag returns indicated that the mean size of the harvested pike was slightly smaller (-0.1 inch) than the mean size of the tagged pike (Fig. 2). This occurrence may have resulted from a spawning population in 1987 composed mostly of large fish. In the other 7 lakes greater numbers of smaller fish may have been present during spawning. For example, in Ellsworth Lake, of the total number of pike harvested during the first year after tagging, 18% were less than 17 inches long. Yet during spring sampling 32% were less than 17 inches long (Fig. 3). This observation does not necessarily suggest that anglers were more efficient in catching larger pike. Most likely, they were releasing the smaller fish because they were undesirable for the creel.

Angler Information

Anglers reported harvesting a total of 371 pike or 6.6% of the pike we had tagged. Tag returns from anglers averaged 5% during the first year after tagging, 1% the second year, and 0.4% after 3 or more years. During the first year after tagging, tag returns from individual lakes varied from 1% to 25% of the total number of pike tagged.

Wisconsin anglers returned 75.3% of the tags followed by Illinois anglers (12.7%) and Minnesota anglers (6.7%). Anglers from Alaska, Colorado, Indiana, Iowa,

Table 1. Comparison of the mean sizes of harvested pike with the mean sizes of spring samples from 8 northwestern Wisconsin lakes.

	Mean Lengths(inches)			
Lake	All Tagged Fish	Angler Returns*	No. Returns	Differences
Long	17.6	20.5	24	+2.9
Lipsett	18.3	19.9	13	+1.6
Little Pike	22.3	22.2	41	-0.1
Wilson	18.1	22.5	11	+4.4
Little Butternut	17.3	19.2	29	+1.9
Ellsworth	18.1	19.4	57	+1.3
Harmon	24.0	26.5	13	+2.5
Potato	19.1	19.7	56	+0.6
MEAN				+1.7

* Based on length at time of tagging.

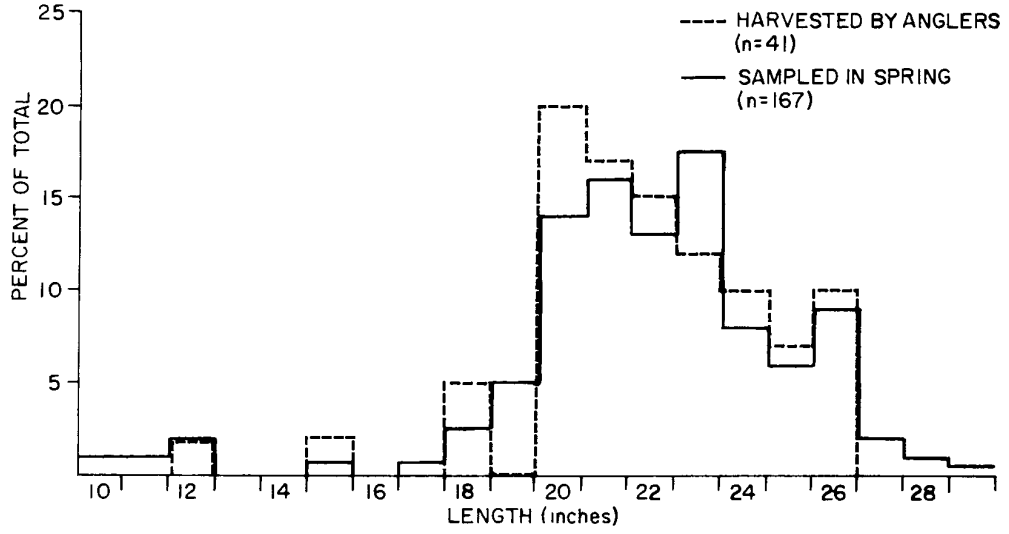

Figure 2. Size structure of northern pike tagged in spring and those harvested during the first year after tagging, Little Pike Lake, 1987.

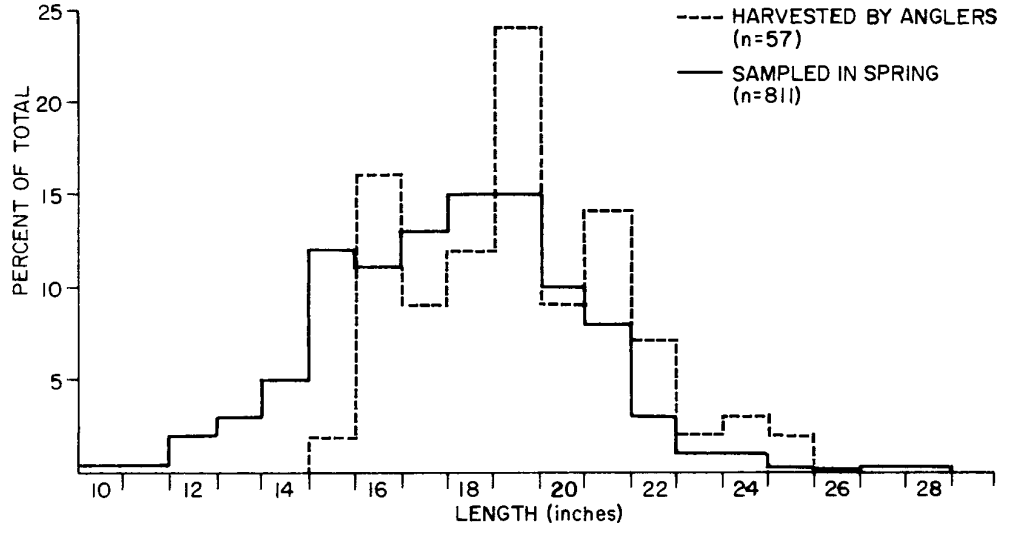

Figure 3. Size structure of northern pike tagged in spring and those harvested during the first year after tagging, Ellsworth Lake, 1986.

Missouri, Ohio, and Texas accounted for the remaining 5.3% of the tag returns.

Approximately two-thirds of all the returned tags were from fish harvested during the open water season, although some lakes were regularly fished during the ice fishing season. Sixty-one percent of the tags returned by anglers who fished Potato Lake (Washburn County) were from fish harvested during the ice fishing season. One-hundred percent of the tags returned by anglers who fished Little Butternut Lake (Polk County) were from the open water season.

Tag returns indicated that Wisconsin anglers caught northern pike during both the open water and ice fishing seasons, while nonresidents fished for pike primarily during the open water season. Wisconsin residents returned 215 tags, 59%

from the open water season and 41% from the ice fishing season. Nonresidents returned 71 tags, entirely from the open water season.

Implications for Management

We used tag returns to determine the angler use of northern pike in 16 northwestern Wisconsin lakes. Analysis of the tag returns suggested that numbers of pike harvested can vary greatly, as can the season during which the pike are caught. As a game fish northern pike are harvested year-round by resident anglers. Pike are especially popular with anglers during the ice fishing season, when bass are sedentary and the season is closed for muskellunge. Pike are also used by nonresidents fishing Wisconsin waters during the open water season. Though most nonresidents who returned tags were from Illinois or Minnesota, anglers from as far away as Alaska and Texas utilized Wisconsin's pike fishery.

Anglers generally harvested pike that were larger than the mean size of the adult population in the study lakes. However, many male pike mature by age 2 and females by age 3, placing many sexually mature fish less than 17 inches in the population.

These smaller fish are generally not acceptable to anglers and may be the reason why anglers caught larger fish. Tagging studies are used in fisheries work to determine exploitation, movement, growth, mortality, and resource use of fish species. Our study of northern pike provides important information on the use of this resource in northwestern Wisconsin.

Reference

Wisconsin Department of Natural Resources. 1979. Fish and Wildlife Comprehensive Plan, Part I: Management strategies 1979-1985.

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